



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
25.04.2018 Bulletin 2018/17

(21) Application number: **15895328.1**

(22) Date of filing: **15.07.2015**

(51) Int Cl.:
A63G 31/02 (2006.01) **A63G 21/04** (2006.01)
A63G 21/06 (2006.01) **A63G 25/00** (2006.01)

(86) International application number:
PCT/CN2015/084039

(87) International publication number:
WO 2016/201755 (22.12.2016 Gazette 2016/51)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
MA

(30) Priority: **18.06.2015 CN 201510340589**

(71) Applicant: **Dalian Wanda Group Co., Ltd.**
Xigang District
Dalian
Liaoning 116011 (CN)

(72) Inventors:
• **HU, Zhanghong**
Chaoyang District
Beijing 100022 (CN)

• **FENG, Chuzhu**
Chaoyang District, Beijing 100022 (CN)
• **WANG, Yuan**
Chaoyang District, Beijing 100022 (CN)
• **MEI, Yong**
Chaoyang District, Beijing 100022 (CN)
• **FU, Hengsheng**
Chaoyang District, Beijing 100022 (CN)
• **WANG, Miao**
Chaoyang District, Beijing 100022 (CN)

(74) Representative: **Lahrtz, Fritz**
Isenbruck Bösl Hörschler LLP
Patentanwälte
Prinzregentenstrasse 68
81675 München (DE)

(54) **ENTERTAINMENT-ORIENTED MULTI-MODE EXPERIENCE SYSTEM**

(57) Disclosed is an entertainment-oriented multi-mode experience system, comprising a closed rail (2) and a riding vehicle (1) traveling along the rail (2). A screen rail (4) is provided at the side of the rail (2). A screen synchronous moving mechanism (5) corresponding to the riding vehicle (1) and capable of traveling is provided on the screen rail (4). The screen synchronous moving mechanism (5) comprises a rotary support device (50) and a traveling device (51). The rotary support device (50) is installed with a screen (3) on the top thereof. The screen (3) is installed on the top of the rotary support device (50) capable of performing a 180° pitching motion via a pitch axis, and the rotary support device (50) is installed on the traveling device (51) capable of performing a 360° rotation in a horizontal plane. The traveling device (51) can travel along with the riding vehicle (1) synchronously on the screen rail (4).

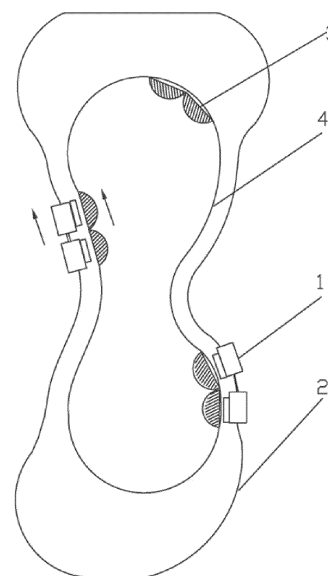


Fig. 7

Description

TECHNICAL FIELD

[0001] The present disclosure generally relates to amusement systems, and more particularly, to amusement-oriented multi-mode experience systems.

BACKGROUND

[0002] Nowadays, the rails of entertainment projects, such as dark rides and roller coasters, are usually single-closed rails, and tourists can only have the experience in a single fixed line. Even for few dual-rail roller coasters, the two rails do not essentially cross or join and are actually two parallel rails, and the running parameters of riding vehicles traveling on these two rails, such as speed, acceleration, etc., are very close, and thus different types of experience cannot be provided. In addition, the dark rides or indoor roller coasters in prior art usually employ fixed scenes, i.e. screens are disposed on some scenes to display dynamic scenarios. The riding vehicle will stop for a period of time upon arriving to the screen and will continue to move after the tourists watch the movies. The above-mentioned ways of fixed screens require the riding vehicle to stop, which is difficult to meet the tourists' demands for watching movies during the traveling process.

SUMMARY

[0003] The purpose of the present disclosure is to provide an amusement-oriented multi-mode experience system. By using the experience system, tourists can watch movies and play games when the riding vehicle is moving.

[0004] An amusement-oriented multi-mode experience system of the present disclosure comprises a closed rail; a riding vehicle traveling along the rail. A screen rail is provided at the side of the rail. A screen synchronous moving mechanism corresponding to the riding vehicle and capable of traveling is provided on the screen rail. The screen synchronous moving mechanism comprises a rotary support device and a traveling device. The rotary support device is installed with a screen on the top thereof. The screen is installed on the top of the rotary support device and is capable of performing a 180° pitching motion via a pitch axis. The rotary support device is installed on the traveling device and is capable of performing a 360° rotation in a horizontal plane. The traveling device can travel along with the riding vehicle synchronously on the screen rail.

[0005] The screen rail is closed and is in parallel with the rail.

[0006] The screen rail is in a straight line shape and is disposed within the rail.

[0007] The screen is a straight screen, an arc screen, a dome screen, an irregular screen or a fog screen.

[0008] The riding vehicle comprises a wheel-type chassis adapted for traveling along the rail and a cabin mounted on the wheel-type chassis.

[0009] The cabin is rotatably and retractably mounted on the wheel-type chassis via a support equipment.

[0010] The rail comprises a stimulating section and a non-stimulating section.

[0011] A rail switching device is mounted at a bifurcation and an intersection of the stimulating section and the non-stimulating section, the rail switching device includes a straight rail, a curve rail, a connector, a slide rail and a driving and controlling device, which can be assembled together into one piece being capable of lateral motion as a whole.

[0012] A static scene and a dynamic scene are disposed on a side of the rail according to the originality of a theater.

[0013] The experience system of the present disclosure incorporates different experience modes, and combines different experience lines and different movie-watching ways. The combination of different lines and different movie-watching ways can provide the tourists with a rich experience of multiple modes. In a single entertainment project, tourists can choose an exciting roller coaster line or a mild changing rail line, the tourists can watch movies on screens or interact when the riding vehicle stops or is traveling.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014]

Figure 1 is a perspective schematic view of a single riding vehicle according to the present disclosure;

Figure 2 is a structural schematic view of several riding vehicles jointed together according to the present disclosure;

Figure 3 is a structural schematic view of a rail according to the present disclosure;

Figure 4 is an operating principle schematic view of a rail switching device according to the present disclosure;

Figure 5 is a structural schematic view of a rail switching device according to the present disclosure;

Figure 6 is a structural schematic view of a screen synchronous moving mechanism according to the present disclosure, a front view and a side view of the screen synchronous moving mechanism are shown therein;

Figure 7 is a schematic view of the distribution of the riding vehicles and screens according to the present disclosure;

Figure 8 is a second schematic view of the distribution of the riding vehicles and screens according to the present disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS

[0015] Specific embodiments of the present disclosure will be described in details below by referring to the drawings.

[0016] The amusement-oriented multi-mode experience system according to the present disclosure comprises a riding vehicle 1, a rail 2, a screen 3, a screen rail 4 and a screen synchronous moving mechanism 5, wherein,

[0017] The riding vehicle 1 is used for carrying tourists, and may move on the fixed rail 2 by employing a wheel-type chassis 10, and each riding vehicle 1 may carry several tourists. A tourist cabin 11 may be directly fixed on the wheel-type chassis 10, or may be connected to the wheel-type chassis 10 via a support equipment 12 (such as a multi-degree-of-freedom motion platform, an industrial robot arm, etc.) as shown in Figure 1. The riding vehicle 1 is either automatically driven by an on-board equipment, or driven by an external equipment, such as a friction wheel, a synchronous linear motor, etc. Since the connection between the riding vehicle 1 and the rail 2 can be achieved by conventional technologies, it will not be described in details herein.

[0018] Each riding vehicle 1 may either travel independently, or be connected in a line, and travel as a train, as shown in Figure 2.

[0019] The rail 2, either in a closed shape or in a linear shape, comprises a stimulating section 21 and a non-stimulating section 22, as shown in Figure 3. The rail of the stimulating section 21 fluctuates significantly, which brings a great change of the velocity and the angular velocity to the riding vehicle 1. The rail of the non-stimulating section 22 does not have significant ups and downs, so that the riding vehicle 1 may travel in a constant velocity along the non-stimulating section 22. Rail switching devices 20 are mounted at a bifurcation and an intersection of the stimulating section 21 and the non-stimulating section 22. As shown in Figures 4 and 5, the rail switching device 20 includes a straight rail 23, a curve rail 24, a connector, a slide rail, and a driving and controlling device including a linear motor, and the rail switching device 20 can move laterally as a whole. When the left end of the straight rail 23 is connected to the present rail, the riding vehicle 1 can be directed to the stimulating section 21 via the rail switching device 20; and when the left end of the curve rail 24 is connected with the present rail, the riding vehicle 1 can be directed to the non-stimulating section via the rail switching device 20. The structures of the straight rail 23 and the curve rail 24 are similar to that of roller coaster rail, and the straight rail 23 and the curve rail 24 can move as a whole after being connected by the connectors. The straight rail 23, the curve rail 24 and the connectors are mounted on a slide rail,

and a linear motor and its actuator are also mounted thereon for controlling the movement of the rail switching device 20. The distribution of riding vehicles in different experience lines of the experience system can also be controlled by controlling the position of the rail switching device 20. The rails of the experience system may also employ network lines formed by several stimulating sections and several non-stimulating sections, so as to provide tourists with rich multi-mode experience.

[0020] Specific scenes, including static scenes and dynamic scenes, are disposed on both sides of the rail 2 according to the originality of a theater. The static scenes are mainly indoor decorations, and the dynamic scenes may be generated by controllable and movable performance props.

[0021] As shown in Figure 7 and Figure 8, a screen rail 4 is provided at the side of the rail 2. The screen rail 4, either in a closed shape or in a linear shape, is parallelly provided at the side of the rail 2. A screen synchronous moving mechanism 5 corresponding to the riding vehicle 1 and capable of traveling is provided on the screen rail 4. As shown in Figure 6, the screen synchronous moving mechanism 5 comprises a rotary support device 50 and a traveling device 51, and the traveling device 51 can travel synchronously with the riding vehicle 1 along the screen rail 4. The rotary support device 50 is installed with a screen 3 on the top thereof. The screen 3 is installed on the top of the rotary support device 50 and is capable of performing a 180° pitching motion via a pitch axis, such that the screen 3 can revert or maintain a certain posture. Meanwhile, the rotary support device 50 is installed on the traveling device 51 and is capable of performing a 360° rotation in a horizontal plane.

[0022] The screens 3 include straight screens, arc screens, dome screens, irregular screens, fog screens, etc. Different types of screens are seamlessly combined with peripheral scenes for displaying specific movies. The tourists can watch movies or interact with elements in the movies.

[0023] The screen synchronous moving mechanisms 5 can either stay still or travel around. When a riding vehicle travels to a position in front of the screen 3, it can either stop before the still screen 3 for watching videos or images, or travel synchronously with the screen 3, so as to provide the function that the tourists can watch videos or images during the traveling process.

[0024] The screen rail 4, which is usually located in the same horizontal plane with the rail 2, can be designed into any shape. However, in the synchronous traveling sections, the screen rail 4 is required to be matching with the rail 2 along which the riding vehicle 1 is traveling. The screen traveling device 51 can travel along the screen rail 4 for supporting the screen 3 or adjusting the posture and position of the screen 3. When the riding vehicle 1 gets close to the screen 3, the screen traveling device 51 travels synchronously with the riding vehicle 1, and adjusts the position and posture of the screen 3, such that the screen 3 is always in front of the tourists during

the traveling process to ensure the immersive feeling of the tourists. The riding vehicle 1 and the screen traveling device 51 of the screen 3 move apart after a period of time of synchronous traveling, and continue to travel along their own rails respectively, and the screen 3 may synchronously travel with another riding vehicle 1 at the next moment. The screen rail 4 may be a closed rail in any shape, or may be a non-closed rail. The screen may reciprocally moves along the non-closed rail, and the movement period of the screen is matching with the interval time between two adjacent riding vehicles. When a non-closed screen rail 4 is employed, the screen 3 is capable of performing a 180° pitching motion via a pitch axis (i.e., reversal motion) to adapt its self with the synchronous traveling with the riding vehicle. When riding vehicle 1 is in the form of two vehicles/line, the moving screen 3 is also in the form of two screens/line.

[0025] In view of above, the present disclosure combines the experiences of a stimulating section and a non-stimulating section in one experience system, so as to satisfy different tourists' demands for different stimulating degrees, and thereby broaden the audience scope of the entertainment project. Network lines can be formed by the crossing and intersecting of different lines, which can significantly improve the space utilization of the entertainment facilities. By employing a moving screen synchronously traveling with the riding vehicle, the tourists may engage into the dynamic scenes during the traveling process, which substantially alters the previous experience mode of stopping for watching movies or interacting with scenes.

Claims

1. An amusement-oriented multi-mode experience system comprising a closed rail and a riding vehicle traveling along the rail, wherein a screen rail is provided at a side of the rail, a screen synchronous moving mechanism corresponding to the riding vehicle and capable of traveling is provided on the screen rail, the screen synchronous moving mechanism comprises a rotary support device and a traveling device, the rotary support device is installed with a screen on the top thereof, the screen is installed on the top of the rotary support device and is capable of performing a 180° pitching motion via a pitch axis, and the rotary support device is installed on the traveling device and is capable of performing a 360° rotation in a horizontal plane, the traveling device can travel along with the riding vehicle synchronously on the screen rail.
2. The amusement-oriented multi-mode experience system of claim 1, wherein the screen rail is closed and is in parallel with the closed rail.
3. The amusement-oriented multi-mode experience

system of claim 1, wherein the screen rail is in a straight line shape and is disposed within the closed rail.

4. The amusement-oriented multi-mode experience system of claim 1, wherein the screen is a straight screen, an arc screen, a dome screen, an irregular screen or a fog screen.
5. The amusement-oriented multi-mode experience system of claim 1, wherein the riding vehicle comprises a wheel-type chassis adapted for traveling along the closed rail and a tourist cabin mounted on the wheel-type chassis.
6. The amusement-oriented multi-mode experience system of claim 5, wherein the cabin is rotatably and retractably mounted on the wheel-type chassis via a support equipment.
7. The amusement-oriented multi-mode experience system of claim 1, wherein the closed rail comprises a stimulating section and a non-stimulating section.
8. The amusement-oriented multi-mode experience system of claim 7, wherein a rail switching device is mounted at a bifurcation and an intersection of the stimulating section and a non-stimulating section, and the rail switching device comprises a straight rail, a curve rail, a connector, a slide rail, and a driving and controlling device, which can be assembled together into one piece being capable of lateral motion as a whole.
9. The amusement-oriented multi-mode experience system of claim 1, wherein a static scene and a dynamic scene are disposed on a side of the closed rail according to the originality of a theater.

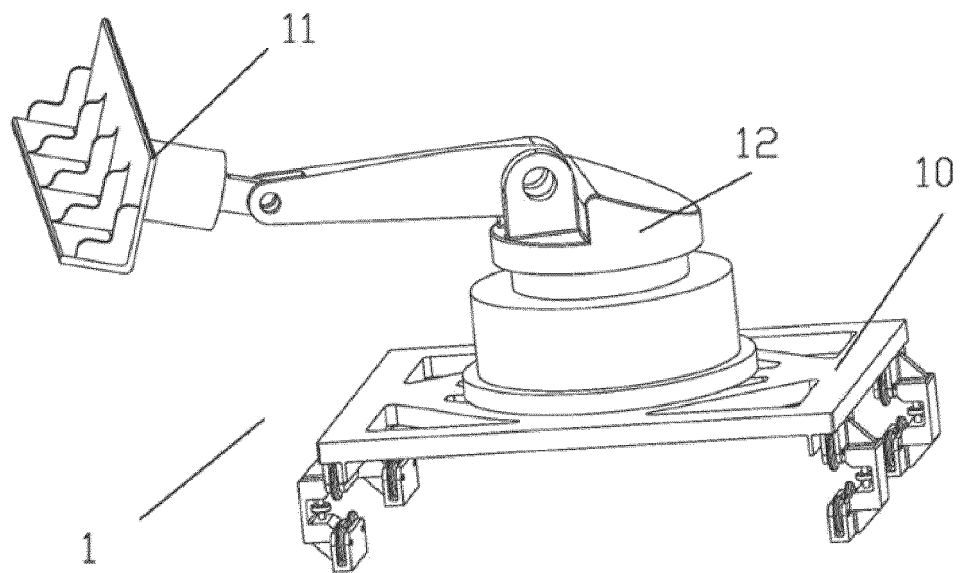


Fig. 1

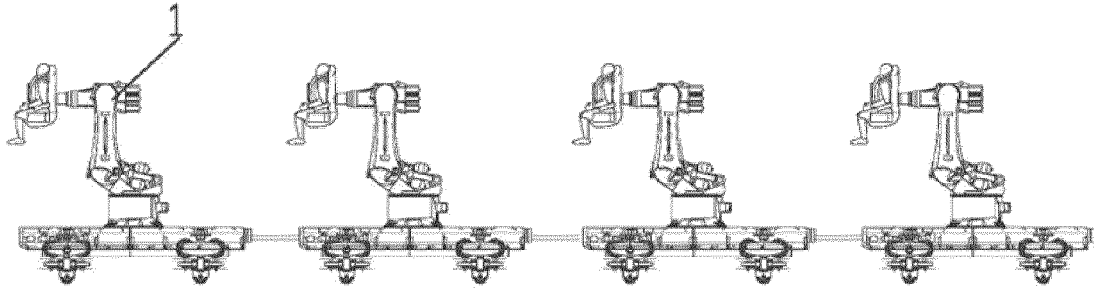


Fig. 2

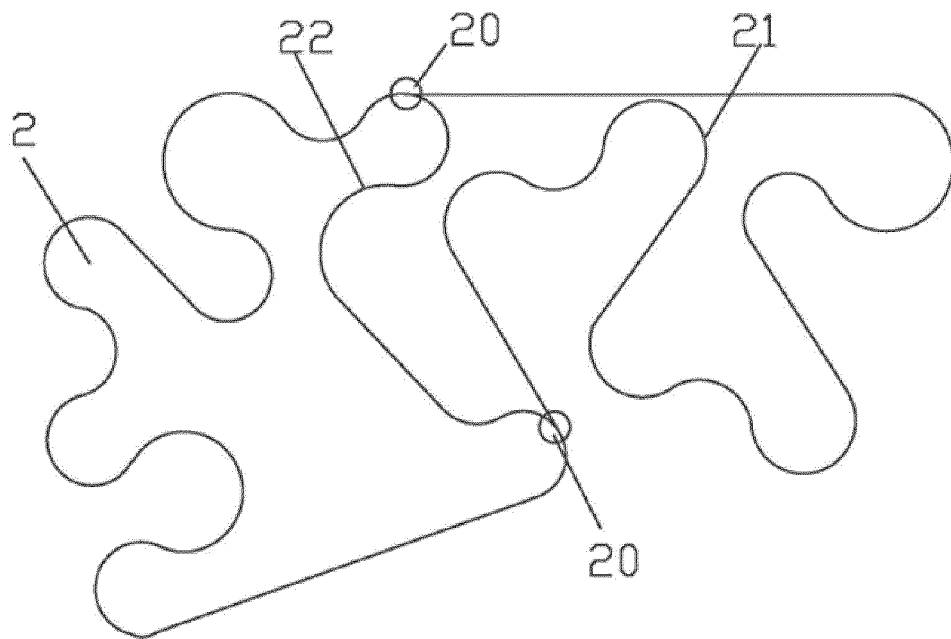


Fig. 3

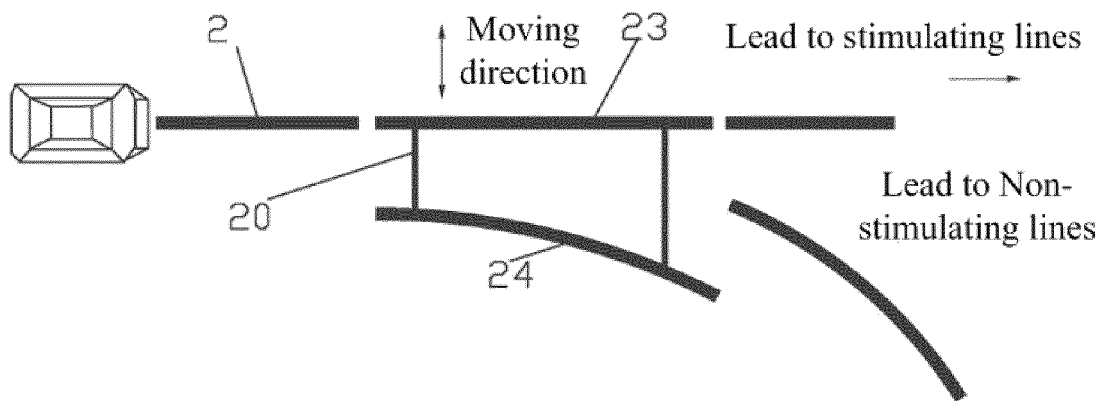


Fig. 4

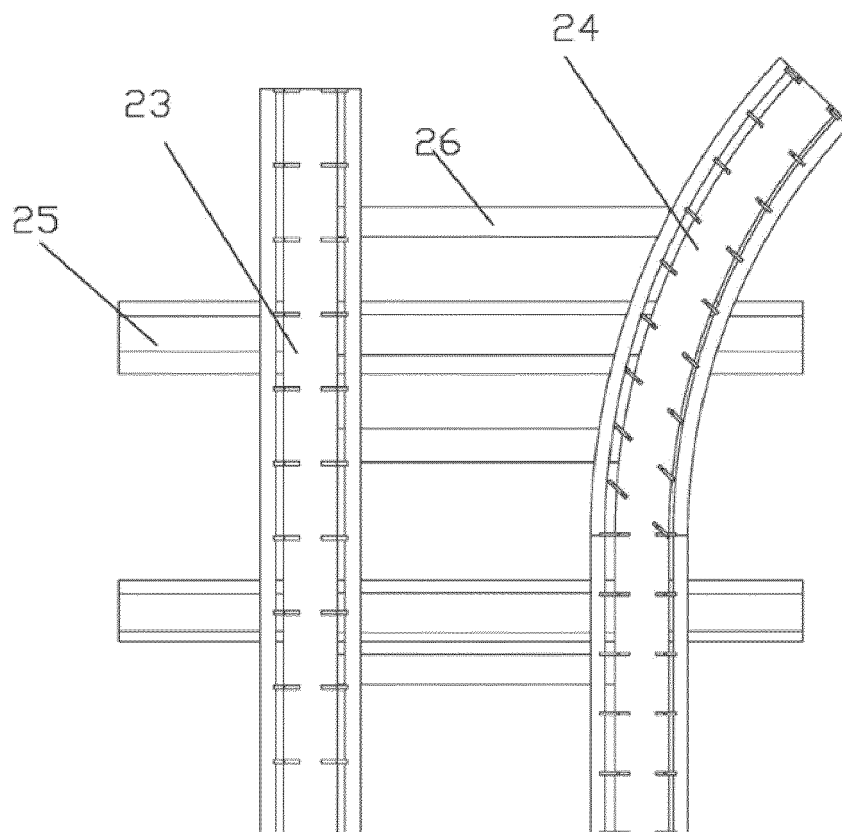


Fig. 5

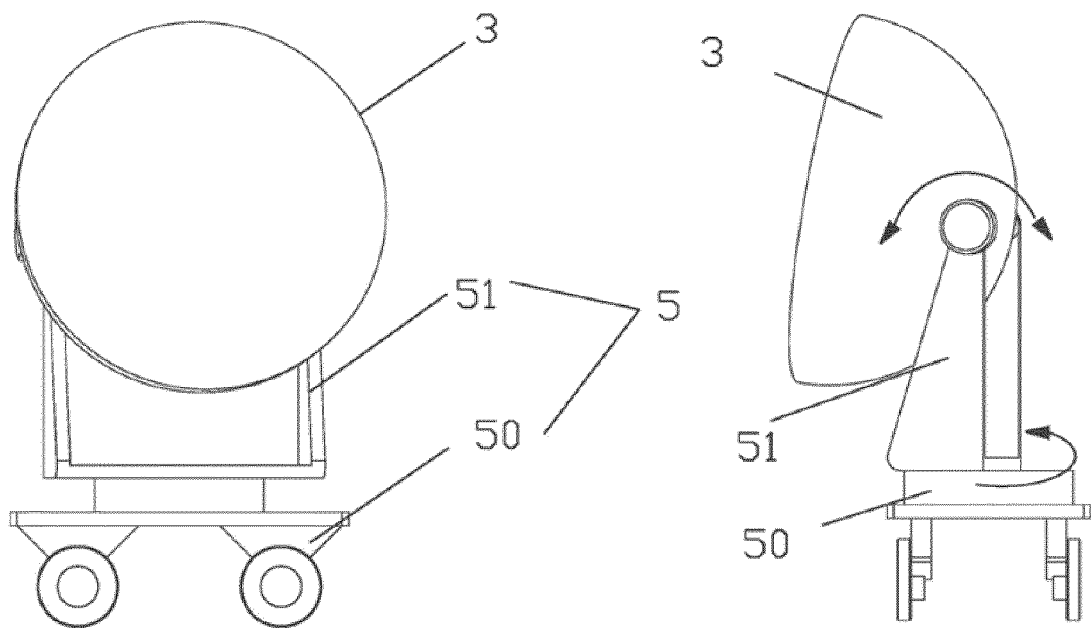


Fig. 6

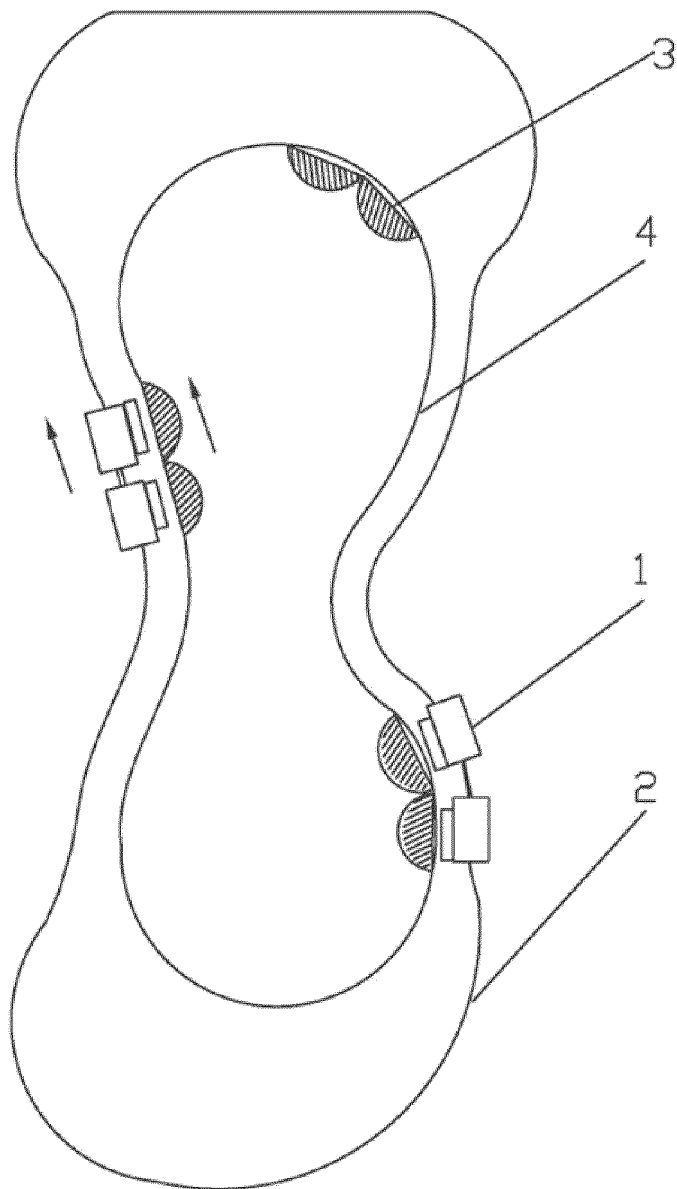


Fig. 7

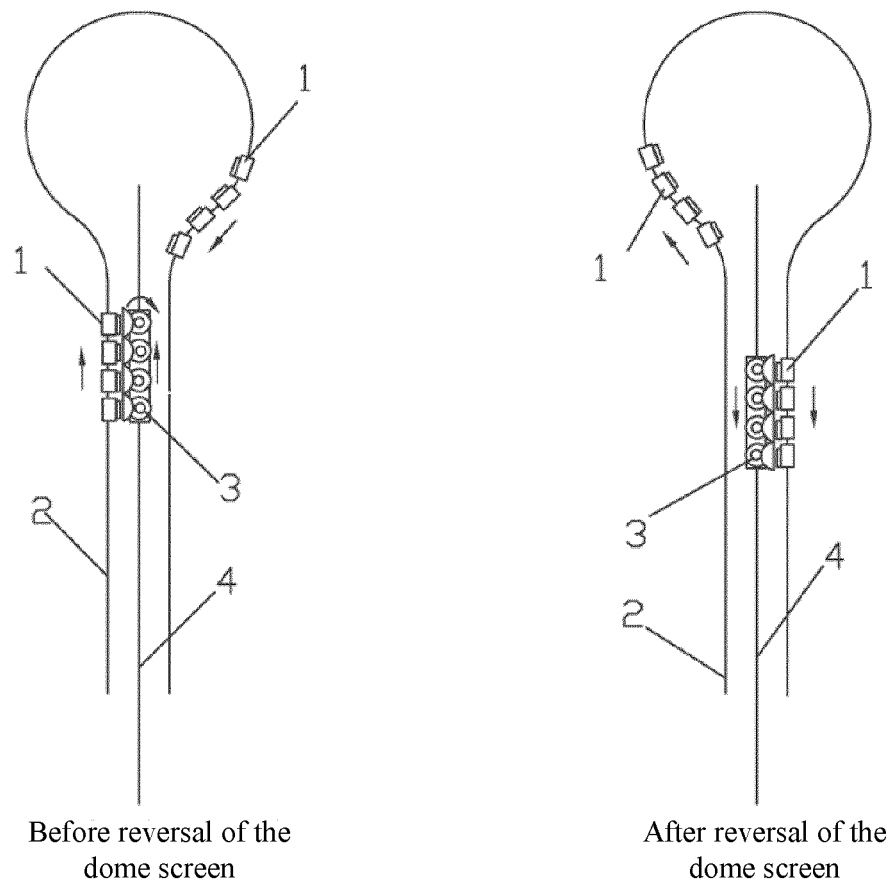


Fig. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2015/084039

A. CLASSIFICATION OF SUBJECT MATTER

A63G 31/02 (2006.01) i, A63G 21/04 (2006.01) i, A63G 21/06 (2006.01) i, A63G 25/00 (2006.01) i
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A63G 31; A63G 21; A63J 25

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, TWABS, VEN, CNKI: synchronous, orbit, roadway, railway, vehicle, car, screen, display, image, video

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN 204745632 U (WANDA CULTURAL TOURISM PLANNING & RES) 11 November 2015 (11.11.2015) the claims	1-9
A	WO 2015071693 A1 (ROBOCOASTER LTD.) 21 May 2015 (21.05.2015) description, page 4, line 10 to page 9, line 9, and figures 1-4	1-9
A	US 2009084285 A1 (VERL ALEXANDER et al.) 02 April 2009 (02.04.2009) the whole document	1-9

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
04 February 2016

Date of mailing of the international search report
11 March 2016

Name and mailing address of the ISA/CN
State Intellectual Property Office of the P. R. China
No. 6, Xitucheng Road, Jimenqiao
Haidian District, Beijing 100088, China
Facsimile No. (86-10) 62019451

Authorized officer
YANG, Yi
Telephone No. (86-10) 62084859

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2015/084039

5	C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
10	A	US 2010053029 A1 (DISNEY ENTPR INC.) 04 march 2010 (04.03.2010) the whole document	1-9
	A	CN 104225922 A (WUHU HUAQIANG CULTURAL TECHNOLOGY IND CO.) 24 December 2014 (24.12.2014) the whole document	1-9
15	A	CN 103212205 A (WANG, Pengbo) 24 July 2013 (24.07.2013) the whole document	1-9
20			
25			
30			
35			
40			
45			
50			
55			

Form PCT/ISA/210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
 Information on patent family members

 International application No.
 PCT/CN2015/084039

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 204745632 U	11 November 2015	None	
WO 2015071693 A1	21 May 2015	None	
US 2009084285 A1	02 April 2009	DE 102007048012 A1	02 April 2009
		US 7971537 B2	05 July 2011
		JP 5683064 B2	11 March 2015
		JP 2009082709 A	23 April 2009
US 2010053029 A1	04 March 2010	US 8179337 B2	15 May 2012
		WO 2010027596 A1	11 March 2010
		EP 2328664 B1	24 July 2013
		EP 2328664 A1	08 June 2011
CN 104225922 A	24 December 2014	None	
CN 103212205 A	24 July 2013	None	